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UNITED STATES PATENT APPLICATION

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ELECTRICAL BOX WITH RECESSED FACEPLATE

## BACKGROUND OF THE INVENTION

### FIELD OF THE INVENTION

This invention relates to boxes for containing the wide variety of electrical equipment that is traditionally installed within electrical boxes, such as receptacles, modular telephone jacks, stationary connectors for coaxial cables, switches, and the like.

### DESCRIPTION OF THE RELATED ART

Electrical equipment, such as receptacles, modular telephone jacks, stationary connectors for coaxial cables, switches, and the like is placed in the walls of almost all modern buildings. Into such devices, electrical connectors of various configurations can be removably inserted to provide a pathway for electricity to be supplied to such device to perform a variety of tasks, including powering an electrical appliance or carrying a signal for a telephone, computer, or television.

The standard faceplate for electrical instrumentalities, *i.e.*, receptacles, modular telephone jacks, stationary connectors for coaxial cables, switches, and the like, is basically a planar device which fits closely against the exterior surface of the wall and is attached, directly or indirectly, to a standard electrical box. An electrical box is the metallic or plastic box which contains one or more electrical receptacles (usually two or four), modular telephone jacks, stationary connectors for coaxial cables, switches, or the like, *i.e.*, electrical instrumentalities, that are permanently connected to the electrical wiring of the building.

Most electrical instrumentalities are connected with screws to the electrical box; the faceplate then is generally connected with screws or by snap-fitting to the electrical instrumentality and is thereby indirectly connected to the electrical box. Other electrical instrumentalities are attached to the faceplate, and the faceplate is directly connected with screws or by snap-fitting to the electrical box. In either case, one or more apertures, designated herein the instrumentality apertures, accommodate the portions of the electrical instrumentalities that are intended to be exposed.

Unlike a standard faceplate, a recessed faceplate, however, has only an edge which fits closely against the exterior surface of the wall; the portion of the recessed wall plate that is in the

3        Recessed faceplates for receptacles, modular telephone jacks, stationary connectors for  
4        coaxial cables, and the like, *i.e.*, electrical instrumentalities, provide the advantage that only the  
5        electrical cords, telephone lines, or cables of an electrical appliance (if the electrical connector  
6        that is physically associated with a particular electrical appliance is attached to a cord, line, or  
7        cable, rather than being directly connected to the appliance) will extend outward from the plane  
8        that forms the surface of a wall into which a receptacle, modular telephone jack, stationary  
9        connector for coaxial cables, or the like, *i.e.*, an electrical instrumentality, has been mounted.  
10      And in the case of switches, nothing will extend beyond the plane of the wall.

Two sections of the National Electrical Code are especially important for an electrical box with a recessed faceplate.

Section 370-20 provides, “In walls or ceilings of concrete, tile, or other noncombustible material, boxes shall be installed so that the front edge of the box will not be set back of the finished surface more than ¼ in. (6.35 mm). In walls and ceilings constructed of wood or other combustible material, boxes shall be flush with the finished surface or project therefrom.”

17 And section 410-56 (e) states, in pertinent part, “Faceplates shall be installed so as to  
18 completely cover the opening and seat against the mounting surface.”

19           The present inventor is aware of a number of United States patents for electrical boxes  
20   with a recessed faceplate, viz., United States patent nos. 4,059,327; 4,936,794; 4,988,832;  
21   5,257,946; 5,387,761; and 5,574,256. None of these, however, have the ability to accommodate  
22   a recessed faceplate adapted to be extended so that, after installation of the box, the faceplate can  
23   be adjusted so that the faceplate meets the preceding requirements of the National Electrical  
24   Code; nor do they provide a mechanism for adapting a traditional electrical box to accommodate  
25   a recessed faceplate.

26 United States patent no. 4,059,327 just has a fixed bracket **20** and **24** against which a  
27 cover plate rigidly mounts in only one possible position. United States patent no. 4,936,794  
28 simply has a recessed faceplate **26** rigidly attached to a tab **18** or **18a** in only one possible  
29 position for a given embodiment of the box; and, in the embodiment using tab **18a**, a slot **36**  
30 leaves an opening in the box, albeit on the outer side of the outlet. United States patent no.

1 4,988,832 employs a faceplate termed a bracket **12** rigidly attached to a stanchion **40**, **42** in the  
 2 box termed a housing **10** in only one possible position. United States patent no. 5,257,946 has a  
 3 recessed cover plate **26** with a rear portion **48** that can be rigidly attached in only one possible  
 4 position, with a screw, to the outlet, which is attached to the outlet box. United States patent no.  
 5 5,387,761 possesses a faceplate **36** that has a recess **42** that is only deep enough to accommodate  
 6 a cover **54**; the faceplate **36** can be rigidly attached to the electrical box **14** in only one possible  
 7 position. And in the device of United States patent no. 5,574,256, the outlet **20** is attached to a  
 8 recessed wall **16** that is an integral portion of the box **10**; and the faceplate **30** mounts to the front  
 9 of the box **10** in only one possible position.

10 Two of the preceding patents, *viz.*, nos. 4,988,832 and 5,387,761 include reclosable  
 11 covers; no. 5,574,256 has a cover that is screwed in place; and United States patent no. 5,272,281  
 12 applies to an electrical outlet safety cover that is screwed in place. None of such covers,  
 13 however, can be slid onto a faceplate.

14 Three patents, *i.e.*, United States patent no. 3,530,230; United States patent no.  
 15 4,090,769; and United States patent no. 4,918,259 are, though known for modifying electrical  
 16 boxes that have already been installed.

17 United States patent no. 3,530,230 discloses two embodiments. The first has an outer  
 18 frame member **12** and a cover plate **14**; the second, an outer frame **40** and a cover plate **46**. In  
 19 both embodiments, however, there is a gap between the walls **18**, **42** and the electrical box **30**,  
 20 **64**. The distance between the cover plate **14**, **46** and the outer frame **12**, **40** is only discretely  
 21 (not continuously adjustable); the outer frame **12**, **40** isn't fastened to anything; and, if the frame  
 22 member **12** is flush against the wall, the cover plate **14** may not even touch the outlet because the  
 23 distance between scoring of the tabs **20** may create a stop for the back of the cover plate **14** that  
 24 is some distance in front of the outlet.

25 The device of United States patent no. 4,090,769 just plugs into an existing outlet, does  
 26 not extend the electrical box, and has no indication that distance it extends from the existing  
 27 electrical box is adjustable.

28 And United States patent no. 4,918,259 explicitly indicates that it does not extend the  
 29 electrical box by stating, "The intent of the present invention is not to extend the receptacles, but  
 30 rather to extend the cover . . . ." Moreover, the distance between the face of the cover frame **36**

1 and the outlet is only discretely (not continuously) adjustable; and the cover frame 36 does not  
2 screw into place.

3           Finally, no electrical box is known to the Inventor wherein switches are mounted so that,  
4   upon installation, the faces of the switches will be other than generally in the same plane as the  
5   wall of the building in which the electrical box is located.

## SUMMARY OF THE INVENTION

1       The present invention includes both a new electrical box with a recessed faceplate and an  
2       electrical box with a recessed faceplate that is created by modifying a traditional electrical box.

3       Both have a one-piece faceplate; but the new electrical box is also designed to  
4       accommodate a two-part faceplate which permits adjusting the distance between the outward  
5       surface of the electrical instrumentality installed within the electrical box and the flange at the  
6       front of the faceplate so that, after installation of the box, it can be assured that the flange of the  
7       faceplate will be flush against the wall in which the electrical box has been installed and that a  
8       wall of the faceplate will be flush against the outward surface of the installed electrical  
9       equipment, thereby meeting, in a relatively easy fashion, the previously cited portions of the  
10      National Electrical Code.

11      Furthermore, no screws or other components of a releasable fastener not employing  
12      screws are exposed in any of the versions of the electrical box; and once the electrical  
13      instrumentality is installed within the box, there are no openings in the electrical box.

14      The preceding is basically accomplished by enlarging both the height and width of the  
15      mouth of the electrical box as well as adding threaded channels to the sides of the electrical box.

16      An extender is used with a traditional electrical box to create the ability to install  
17      electrical instrumentalities within the assembled electrical box in a recessed aspect while still  
18      insuring that the assembled box extends sufficiently close to the finished surface of the wall in  
19      which the electrical box has been installed to meet the relevant portions of the National Electrical  
20      Code.

21      Optionally, a sliding cover may be removably attached over either the one-piece or the  
22      two-piece recessed faceplate.

23      An additional embodiment is a new electrical box for one or more switches wherein the  
24      switches are to be oriented so that upon installation the faces of the switches will be other than  
25      parallel to the wall of building in which the electrical box is placed.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 illustrates an Electrical Box with Recessed Faceplate having a one-piece box recessed faceplate but designed to accommodate a two-piece recessed faceplate.

Figure 2 is the same embodiment as that of Figure 1 with the addition of a sliding cover.

Figure 3 depicts an Electrical Box with Recessed Faceplate having a two-piece recessed faceplate.

Figure 4 is the same embodiment as that of Figure 3 with the addition of a sliding cover.

Figure 5 shows an Electrical Box with Recessed Faceplate that is created by modifying a traditional electrical box.

Figure 6 portrays an Electrical Box with Recessed Faceplate for switches wherein the switches are to be oriented so that upon installation the faces of the switches will be other than parallel to the wall of building in which the electrical box is placed.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

1       The Electrical Box with Recessed Faceplate having a one-piece recessed faceplate but  
2       designed to accommodate a two-piece recessed faceplate has, as illustrated in Figure 1, a box 1  
3       into which a one-piece recessed faceplate 2 is removably inserted.

4       The box 1 has an open front or mouth 3 and a closed back 4, although the rear wall 4  
5       contains the knock-out tabs that are well known in the art for creating openings through which  
6       wiring can pass.

7       Attached to and projecting generally forward from the rear wall 4 is a lateral surface 1500  
8       that connects the perimeter 1501 of the rear wall 4 to a first end 1502 of a connecting wall 1503  
9       which connecting wall 1503 extends generally outward from, and preferably, perpendicular to,  
10      the lateral surface 1500. Attached to and projecting generally forward from the second end 1504  
11      and from the sides 1505 of the connecting wall 1503 is the first end 1506 of the front portion 11.  
12      The second end 1507 of the front portion 11 forms the mouth 3 of the box 1.

13      The top 5, bottom 6, and sides 7 of the rear portion 8 of the box 1 each contain a channel  
14      9 extending into the box 1 to accommodate a releasable fastener, preferably a screw, 10, with  
15      each channel 9 extending toward the back 4 of the box 1 and preferably being generally centrally  
16      located across the top 5, bottom 6, and each side 7 of the box 1.

17      In the preferred embodiment, the box 1 has a rectangular cross section. As illustrated in  
18      Figure 1 and Figure 2, the front portion 11 of the box 1 extends beyond the top 5 and beyond the  
19      bottom 6 of the rear portion 8. A top wall 12 that is preferably generally parallel to the front 3  
20      and the back 4 of the box 1 runs from the top 5 of the rear portion 8 to the top 13 of the front  
21      portion 11 of the box 1 and between the sides 7 of the box 1. Similarly, a bottom wall 16 that is  
22      preferably generally parallel to the front 3 and the back 4 of the box 1 runs from the bottom 6 of  
23      the rear portion 8 to the bottom 17 of the front portion 11 of the box 1 and between the sides 7 of  
24      the box 1. Thus, in the preferred embodiment, the connecting wall 1503 is comprised of the top  
25      wall 12 and the bottom wall 16 and sides 7 which are integrally formed with the sides 7 of the  
26      rear portion 8 and the sides 7 of the front portion 11 of the box 1.

27      As suggested above, the interior ends 1001 of the channels 9 lie within the front portion  
28      11 of the box 1; such ends 1001 are preferably covered except for a threaded aperture 1002 in  
29      such ends 1001 and are preferably all substantially aligned with one another.



The channels **9** and, in the preferred embodiment, the threaded apertures **1002** of the upper and lower channels **9** are used either to attach an electrical instrumentality **15** or a faceplate to the box **1**. Whether the attachment is for an electrical instrumentality **15** or a faceplate is determined by whether the electrical instrumentality **15** is intended to be attached to the faceplate or directly to the box **1**. This is the same situation as for traditional electrical boxes. If the electrical instrumentality **15** is intended to be attached directly to the box **1**, the threaded apertures **1002** of the upper and lower channels **9** each accommodate a screw **10** for holding the electrical instrumentality **15** to the box **1**, as illustrated in Figure 1 through Figure 4. Otherwise, the threaded apertures **1002** of the upper and lower channels **9** would be available to retain a screw **10** for holding the faceplate to the box **1**.

Furthermore, as is the case with traditional faceplates, attachment of an electrical instrumentality **15** to a faceplate can be permanent or releasable, at least when the faceplate is intended to be attached directly to the box **1**.

Retention of faceplates, whether one-piece or two-piece, to electrical boxes **1** is, as indicated above, preferably done with screws **10**, as illustrated in Figure 1 through Figure 4, since screws tend to pull the faceplate against the mounting surface. However, the only essential feature is that a releasable fastener be used to hold the faceplate either directly to the box **1** or indirectly to the box **1** by having the faceplate directly attached, with a releasable fastener, to an electrical instrumentality **15** that is, itself, directly connected to the box **1** with a releasable fastener. Thus, for example, any type of snap-fit for a faceplate to the box **1** or to the electrical instrumentality **15** that is well known in the art may be employed.

For the embodiments depicted in Figure 1 through Figure 4, the top wall 12 contains an aperture 19 to accommodate a screw 10 that extends through the top wall 12 outside the box 1. Similarly, the bottom wall 16 contains an aperture 20 to accommodate a screw 10 that extends through the bottom wall 16 outside the box 1 for the same purpose as the aperture 19. Apertures 19, 20 accommodate screws 10 which are used to attach faceplates to the type of electrical instrumentality 15 depicted in Figure 1 through Figure 4, using threaded aperture 101 of the electrical instrumentality 15. For different electrical instrumentalities, however, the number and location of apertures for attaching a faceplate to an electrical instrumentality 15 depend upon particular electrical instrumentality 15 that is utilized.

The one-piece recessed faceplate **2** has a rear wall **26** containing one or more instrumentality apertures **27** to accommodate the electrical instrumentality **15**. Attached to and projecting generally forward from the rear wall **26** is an interior surface **1400** that connects the perimeter **1401** of the rear wall **26** to a flange **33**. The rear wall **26** has substantially the same shape as does the cross section of the front portion **11** of the box **1**. In the case of a box **1** having a traditionally rectangular cross section, as depicted in Figure 1 and Figure 2, the interior surface **1400** comprises a top **27**, bottom **28**, and two sides **29** attached to one another so as to form a four-sided object. To the front **30** of the top **27**, the front **31** of the bottom **28**, and the front **32** of the two sides **29** is attached a flange **33**, the back side **34** of which flange **33** is designed to seat against the mounting surface. The faceplate **2** has, in comparison to the box **1**, dimensions such that the flange **33** extends from the interior surface **1400** of the box **1** to a position laterally beyond the front of the mouth **3**.

The rear wall **26** is also adapted to accommodate a releasable fastener for fastening the faceplate **2** directly or indirectly, through the electrical instrumentality **15**, to the box **1**. Preferably, this consists of one or more apertures **1003** to accommodate screws **10**.

Thus, the Electrical Box with Recessed Faceplate having a one-piece recessed faceplate has a box **1** adapted to accommodate a two-piece recessed faceplate **25**, has no screws **10** or analogous components of another type of releasable fastener exposed within the box **1** behind the installed electrical equipment **15**, and possesses no substantial gaps or apertures other than those designed to accommodate the installed electrical equipment **15** and screws **10** or components of another type of releasable fastener. The description to this point has concentrated upon the embodiments depicted in Figure 1 through Figure 4. Any embodiment utilizing the inventive features described in the first sentence of this paragraph would, however, fall within the scope of this invention, *e.g.*, the cross section of the box **1** need not necessarily be rectangular.

Attached to the top 13 of the front portion 11 or to the top 5 of the rear portion 8 of the box 1, but preferably to the top 13 of the front portion 11 of the box 1, and also to the bottom 17 of the front portion 11 or to the bottom 6 of the rear portion 8 of the box 1, but preferably to the

bottom **17** of the front portion **11** of the box **1**, are projections **134** between which nails can be inserted to fasten the box **1** to a surface, preferably a stud.

As shown in Figure 2, the sides **35** of the flange **33** optionally contain channels **36** running along the edge **37** of the flange **33** to accommodate longitudinal tabs **38** of a cover **39** so that the cover **39** can be removably placed over the Electrical Box with Recessed Faceplate. In the embodiment of Figure 2, the lower portion **40** of the flange **33** contains one or more indentations **41** to accommodate the electrical cords, telephone lines, or cables of any electrical instrumentality that may be plugged into the receptacle **15**.

The cover **39** preferably has a front surface **141**, a top **42** connected to the front surface **41**, and two sides **43** each of which is connected to the front surface **141** and to the top **42** to form a four-sided structure. The longitudinal tabs **38** extend inward from each side **43**, and the top **42** functions as a stop to preclude the cover **39** from sliding below the flange **33**.

The outer portion **24** of the two-piece recessed faceplate **25** is constructed just as is the one-piece recessed faceplate **2** except that such outer portion **24** does not have a rear wall **26** but instead has attached to each side **29** a longitudinal projection **201** extending inward having an aperture **44** to accommodate a screw **10** or other releasable fastener that will draw toward the box **1**, and retain, the outer portion **24** of the two-piece recessed faceplate **25**. This pulls the back side **34** of the flange **33** against the mounting surface.

The inner portion **45** of the two-piece recessed faceplate **25** is constructed the same as the one-piece recessed faceplate **2** except that it does not have the flange **33** but does possess the number of apertures **46**, two apertures **46** in the case of screws **10**, to accommodate the releasable fasteners that draw the outer portion **24** of the two-piece recessed faceplate **25** to the box **1**.

The top **27**, bottom **28**, and two sides **29** for the outer portion **24** of the two-piece recessed faceplate **25** are sized so that they will slide along the inside of the top **27**, bottom **28**, and two sides **29**, respectively, of the inner portion **45** in order that there will substantially be no gaps between these corresponding features.

As depicted in Figure 4, the outer portion **45** of the two-piece recessed faceplate **25** optionally is designed, just as is the one-piece recessed faceplate **2**, to have a cover **39**.

3 An extender **47** is placed around the traditional electrical box **46** to create an electrical  
4 box that is designed to have the electrical instrumentality **15** located in essentially the same  
5 position as with the unmodified traditional electrical box **46** but having the electrical box extend  
6 beyond that position.

7           The extender **47** has a first side **48** and a second side **49** constructed to slide along the  
8 outside surface of the sides **7** of the traditional electrical box **46**, preferably leaving no substantial  
9 gaps between the sides **7** of the traditional electrical box **46** and the sides **48**, **49** of the extender  
10 **47**. Because the traditional electrical box **46** has two projections **50** on the side **7** along which  
11 the second side **49** of the extender **47** slides, the second side **49** of the extender **47** contains two  
12 channels **51** to accommodate the projections **50**.

At a distance, from the back **52** of the sides **48, 49** of the extender **47**, greater than the distance between the open front **3** of the traditional electrical box **46** and the projections **134** to hold nails **401**, and preferably a distance substantially equal to the distance between the open front **3** and the closed back **4** of the traditional electrical box **46**, a wall **53** is attached to the sides **48, 49** and runs from the bottom **54** to the top **55** of the sides **48, 49** of the extender **47** and from the first side **48** to the second side **49** of the extender **47**. The sides **48, 49** and the wall **53** of the extender proceed both above and below the traditional electrical box **46**. Each side **48, 49** contains an aperture **301** that will be above a height equal to the top **5** and an aperture **302** that will be below the level of the bottom **6** of a traditional electrical box **46**, with such apertures **301, 302** also being at a position that will be in general alignment with the projections **134** when the extender **47** is placed on a traditional electrical box **46**. The apertures **301, 302** then accommodate the nails **401** that go through the projections **134**.

25 Contained within the wall **53** are one or more instrumentality apertures **154** to  
26 accommodate the electrical instrumentality **15**. The one or more instrumentality apertures **154**  
27 can extend as far as desired toward the sides **48, 49**, even reaching the sides **48, 49**.

The wall **53** also has a lower aperture **55** and an upper aperture **56**, placed so as to be generally aligned with the lower channel **9** and upper channel **9** of a traditional electrical box **46** when the extender **47** has been placed on a traditional electrical box **46**, for screws **10** that will

1 extend into the upper and lower channels **9** of the traditional electrical box **46** to fasten an  
2 electrical instrumentality **15** or a faceplate to the traditional electrical box **46**. Optionally, below  
3 the lower aperture **55** is an aperture **57** to accommodate a screw **10** that extends through the wall  
4 **53** below the bottom **6** of the traditional electrical box **46**. Similarly and optionally, above the  
5 upper aperture **56** is an aperture **59**. Apertures **57**, **59** accommodate screws **10** which are used to  
6 attach faceplates to the type of electrical instrumentality **15** depicted in Figure 5, using threaded  
7 aperture **101** of the electrical instrumentality **15**. The number and location of apertures for  
8 attaching a faceplate to an electrical instrumentality depend upon the particular electrical  
9 instrumentality **15** that is utilized.

10 Whether the attachment using apertures **55**, **56** is for an electrical instrumentality **15** or  
11 the wall **53** is determined by whether the electrical instrumentality **15** is intended to be attached  
12 to the wall **53** or directly to the traditional electrical box **46**. This is the same situation as for the  
13 new electrical box. If the electrical instrumentality **15** is intended to be attached directly to the  
14 traditional electrical box **46**, the threaded apertures **1002** of the upper and lower channels **9** each  
15 accommodate a screw **10** for holding the electrical instrumentality **15** to the traditional electrical  
16 box **46**, as illustrated in Figure 5. Otherwise, the threaded apertures **1002** of the upper and lower  
17 channels **9** would be available to retain a screw **10** for holding the wall **53** to the traditional  
18 electrical box **46**.

19 Furthermore, as is the case with traditional faceplates, attachment of an electrical  
20 instrumentality **15** to the wall **53** can be permanent or releasable.

21 An upper segment **1020** runs along and is attached to the top **1021** of the wall **53** between  
22 the sides **48**, **49** of the extender **47** from the wall **53** to the front **1022** of the sides **48**, **49** and is  
23 also attached to the top **55** of the sides **48**, **49**. Similarly, a lower segment **1030** runs along and is  
24 attached to the bottom **1031** of the wall **53** between the sides **48**, **49** of the extender **47** from the  
25 wall **53** to the front **1022** of the sides **48**, **49** and is also attached to the bottom **54** of the sides **48**,  
26 **49**.

27 Finally, a particular version of an Electrical Box with Recessed Faceplate is a switch box  
28 **600** which has two generally L-shaped sides **601**, a back panel **602** running the length of and  
29 attached to a first end **603** of each L-shaped side **601**, a bottom panel **604** attached to and running  
30 between the bottom **605** of the L-shaped sides **601** and also running along and attached to the

bottom 606 of the back panel 602, a front panel 607 attached to a second end 608 of each L-shaped side 601 running between the L-shaped sides from the bottom 605 of the L-shaped sides to the vertex 609 of the L and also attached to the bottom panel 604, and a U-shaped ledge 610 having the inside 611 of the bottom 612 of the U-shaped ledge 610 attached to the top 613 of the front panel 607 and the outside 614 of the legs 615 of the U-shaped ledge 610 attached to the generally L-shaped sides 601 in substantial alignment with the inside edge 616 of the shorter leg 617 of the L.

Thus, an aperture 618 exists in the U-shaped ledge 610 to accommodate a switch 619. A threaded aperture 620 in each leg 615 of the U-shaped ledge 610 accommodates a screw 10 to hold the switch 619 in place.

A primary aperture 621, consequently, also exists above the front panel 607. An insert 622 having a top 623, bottom 624, and two sides 625 has an aperture 626 in the bottom to accommodate the switch 619. The insert 622 slidably mounts within the primary aperture 621, *i.e.*, above the U-shaped ledge 610. An aperture 627 in one or more ends 628 of the bottom 624 of the insert 622 is designed to be substantially aligned with one or more secondary threaded apertures 629 in the legs 615 of the U-shaped ledge 610 after the insert 622 has been placed into the primary aperture 621 in order to accommodate a screw 10 to hold the insert 622 in place.

Finally, a flange 630 extends from the outer edges 631 of the insert 622 generally perpendicular to the top 623, bottom 624, and two sides 625 of the insert 622. The flange 630 is designed to seat substantially against the mounting surface.

Whenever in the preceding discussion a threaded aperture has been mentioned, a non-threaded aperture could, instead, be used together with a threaded nut; and the term “threaded aperture” is intended to encompass such structure.